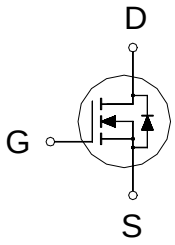
**NIKO-SEM**

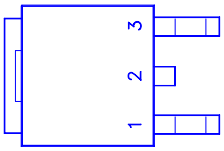
# N-Channel Logic Level Enhancement Mode Field Effect Transistor

**P75N02LDG**
**TO-252 (DPAK)**
**Lead-Free**

## PRODUCT SUMMARY

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 25 | 5mΩ | 75A |




1. GATE
2. DRAIN
3. SOURCE

## ABSOLUTE MAXIMUM RATINGS ($T_C$ = 25 °C Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|---|---|---|---|---|
| Gate-Source Voltage | | $V_{GS}$ ± | 20 | V |
| Continuous Drain Current | $T_C$ = 25 °C | $I_D$ | 75 | A |
| | $T_C$ = 100 °C | | 50 | |
| Pulsed Drain Current[1] | | $I_{DM}$ | 170 | |
| Avalanche Current | | $I_{AR}$ | 60 | |
| Avalanche Energy | L = 0.1mH | $E_{AS}$ | 140 | mJ |
| Repetitive Avalanche Energy[2] | L = 0.05mH | $E_{AR}$ | 5.6 | |
| Power Dissipation | $T_C$ = 25 °C | $P_D$ | 60 | W |
| | $T_C$ = 100 °C | | 32.75 | |
| Operating Junction & Storage Temperature Range | | $T_j$, $T_{stg}$ | -55 to 150 | °C |
| Lead Temperature ($^1/_{16}$" from case for 10 sec.) | | $T_L$ 275 | | |

## THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|---|---|---|---|---|
| Junction-to-Case | $R_{\theta JC}$ | | 2.3 | °C / W |
| Junction-to-Ambient | $R_{\theta JA}$ | | 62.5 | |
| Case-to-Heatsink | $R_{\theta CS}$ | 0.6 | | |

[1]Pulse width limited by maximum junction temperature.
[2]Duty cycle ≤ 1%

## ELECTRICAL CHARACTERISTICS ($T_C$ = 25 °C, Unless Otherwise Noted)

| PARAMETER SY | MBOL | TEST CONDITIONS | LIMITS MIN | T YP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **STATIC** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 25 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 1 | 1.5 | 3 | |
| Gate-Body Leakage | $I_{GSS}$ V | $_{DS}$ = 0V, $V_{GS}$ = ±20V | | | ±250 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 20V, $V_{GS}$ = 0V | | | 25 | μA |
| | | $V_{DS}$ = 20V, $V_{GS}$ = 0V, $T_J$ = 125 °C | | | 250 | |



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| | | | | | | |
|---|---|---|---|---|---|---|
| On-State Drain Current[1] | $I_{D(ON)}$ | $V_{DS}$ = 10V, $V_{GS}$ = 10V | 70 | | | A |
| Drain-Source On-State Resistance[1] | $R_{DS(ON)}$ | $V_{GS}$ = 10V, $I_D$ = 30A | | 5 | 7 | mΩ |
| | | $V_{GS}$ = 7V, $I_D$ = 24A | | 6 | 8 | |
| Forward Transconductance[1] | $g_{fs}$ V | $_{DS}$ = 15V, $I_D$ = 30A | | 16 | | S |
| **DYNAMIC** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 15V, f = 1MHz | | 5000 | | pF |
| Output Capacitance | $C_{oss}$ | | | 1800 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | 800 | | | |
| Total Gate Charge[2] | $Q_g$ | $V_{DS}$ = 0.5$V_{(BR)DSS}$, $V_{GS}$ = 10V, $I_D$ = 35A | | 140 | | nC |
| Gate-Source Charge[2] | $Q_{gs}$ | | | 40 | | |
| Gate-Drain Charge[2] | $Q_{gd}$ | | 75 | | | |
| Turn-On Delay Time[2] | $t_{d(on)}$ | $V_{DS}$ = 15V, $R_L$ = 1Ω, $I_D$ ≅ 30A, $V_{GS}$ = 10V, $R_{GS}$ = 2.5Ω | | 7 | | nS |
| Rise Time[2] | $t_r$ | | 7 | | | |
| Turn-Off Delay Time[2] | $t_{d(off)}$ | | 24 | | | |
| Fall Time[2] | $t_f$ | | | 6 | | |
| **SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C$ = 25 °C)** | | | | | | |
| Continuous Current | $I_S$ | | | | 75 | A |
| Pulsed Current[3] I | $_{SM}$ | | | | 170 | |
| Forward Voltage[1] V | $_{SD}$ I | $_F$ = $I_S$, $V_{GS}$ = 0V | | | 1.3 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$ = $I_S$, $dI_F/dt$ = 100A / µS | | 37 | | nS |
| Peak Reverse Recovery Current | $I_{RM(REC)}$ | | 200 | | | A |
| Reverse Recovery Charge | $Q_{rr}$ | | | 0.043 | | µC |

[1]Pulse test : Pulse Width ≤ 300 µsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

**REMARK: THE PRODUCT MARKED WITH "P75N02LDG", DATE CODE or LOT #**

**Orders for parts with Lead-Free plating can be placed using the PXXXXXXXG parts name.**

# TO-252 (DPAK) MECHANICAL DATA

| Dimension | mm | | | Dimension | mm | | |
|---|---|---|---|---|---|---|---|
| | Min. T | yp. | Max. | | Min. T | yp. | Max. |
| A | 9.35 10.4 | | | H | 0.89 | | 2.03 |
| B | 2.2 2.4 | | | I | 6.35 | | 6.80 |
| C | 0.45 | | 0.6 J 5.2 | | | | 5.5 |
| D | 0.89 | 1.5 | | K | 0.6 | | 1 |
| E | 0.45 0.69 | | | L 0.5 | | | 0.9 |
| F | 0.03 0.23 | | | M | 3.96 | 4.57 | 5.18 |
| G | 5.2 6.2 | | | N | | | |